

submarine solar radiation, the chemical features of sea water, and the interrelations of the sea and the atmosphere. Reports on the result of several important expeditions were presented and accounts were given of the work of leading organizations, such as that of the International Hydrographical Bureau.

Cooperative Projects. A number of projects that require international cooperation were discussed. Among them were: a proposal for an international survey of the Gulf Stream area; the units which should be used in the specification of the different common constituents of sea water and on the necessity of a world-wide uniformity of procedure; the desirability of fixing standard levels for oceanic observations; the new edition of the general bathymetric chart of the oceans; the criteria and nomenclature for the major divisions of the ocean bottom; the study of ocean swell in the proximity of shore and a plan for the international study of marine erosion on the sea-shore; and the organization of geophysical work in the Mediterranean sea. There were discussions jointly with other associations of the Union. One of these, the interaction between the sea and the atmosphere, was at a joint meeting of the Association for Meteorology and that for Physical Oceanography. Another joint discussion with other Associations was the use and value of geophysical methods in the attack upon the structural problems of oceanic and continental areas. The discussions were very stimulating, even inspiring.

Committees. The old Committees on tides, mean sea level and its variations, and (jointly with other Associations) the study of so-called tidal waves (*raz de marée*), were continued. Several new Committees were appointed covering several of the subjects that were topics for general discussion. Among these there were committees for an international survey of the Gulf Stream, for the units to be used in the specification of the different chemical constituents of sea water, for the designation of standard levels for oceanic observations, for the criteria and nomenclature of the major division of the ocean bottom, and jointly, with the Association for Meteorology, one on the interaction between the sea and the atmosphere. As I did not take down the names of all those who were appointed as members of the different Committees, it seems inadvisable to give an incomplete list.

New Officers. The following officers of the Association were elected, B. Helland-Hansen, President; Fichot, Vice-President; J. Proudman, Secretary.

During the meeting there was on September 19 an excursion of particular interest to the oceanographers, on the Scottish Fisheries steamer *Explorer*, under the able leadership of J. B. Tait, hydrographer of the Scottish Fisheries Service. It was an all day excursion on the Firth of Forth. The vessel went from Leith docks to the mouth of the Forth. On the excursion Mr. Carruthers gave a demonstration of the use of a current meter designed by him; and D. J. Matthews demonstrated the use of a frameless water bottle recently designed by him. On the same day there was a parallel excursion on the *Armauer Hansen*, the research vessel of the Geophysical Institute in Bergen, under the leadership of Helland-Hansen. Those who took part in the excursion had an opportunity to see both vessels.

Conclusions. From the notes above made it will be seen that great interest was manifested in the proceedings of the Association by the presence of delegates from many countries and the rather large attendance at the different sessions of the Association. Nearly all of the important oceanic areas of the world were considered and there were papers of high quality on almost every aspect of physical oceanography. Many projects requiring interna-

tional cooperation were discussed and committees were appointed to bring about appropriate international action. The meeting was very successful. (*Author's Abstract.*)

Discussed by Messrs. McNISH, HUMPHREYS, SMITH and WENNER.

O. E. MEINZER: *Notes on Proceedings of the Association of Hydrology, September 1936, at the Sixth General Assembly of the International Union of Geodesy and Geophysics in Edinburgh.*—The outstanding feature of the hydrology meetings in Edinburgh was the three-day conference on snow, conducted by the Commission on Snow, with the cooperation of the Commission on Glaciers. This conference was arranged through the energetic and cooperative efforts of Dr. J. E. Church, of the University of Nevada, who was the organizer of the Commission on Snow and is still its Chairman. Unfortunately, on account of serious illness in Moscow, he did not reach Edinburgh until after the snow conference, but the conference was nevertheless very successful. The American Section of Hydrology was represented by four eminent authorities on ice and snow, namely, Professors Hobbs and Gould and Messrs. McLaughlin and Elges.

At the regular hydrology meetings about one day each was devoted to the Commissions on Streams, Lakes, Underground Waters, and Practical Applications, and many important problems covering a wide range in the science of hydrology were discussed. The meetings were attended by a small group of able hydrologists, most of whom have a broad scientific interest in hydrology but with less specialization than among the hydrologists in the United States. There was an enthusiastic delegation from France and most of the smaller European countries were represented by one or more able men, among whom I may mention Mr. Smetana, of Czechoslovakia, the genial and energetic President of the Association of Hydrology, Mr. Lutschg, of Switzerland, the President elect, and Mr. Slettenmark of Sweden, the Vice-President elect. Mr. Dienert, of France, continues as the Secretary of the Association.

Action was taken to hold a round table at the Washington meeting in 1939 on the problem of making greater use of the hydraulic laboratories in research in hydrology and other departments of earth physics.

Discussed by Messrs. VAUGHAN and HECK.

H. E. McCOMB, *Recording Secretary*

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CHEMISTRY.—*The carotenoid pigments of the sweet potato* (*Ipomoea batatas*, Poir.).¹ M. B. MATLACK, Food Research Division, Bureau of Chemistry and Soils.

It has been shown (1, 2) that the sweet potato is a good source of vitamin A. This fact and the natural color of the tuber leads one to suspect the presence of at least one of the four known carotenoids which possess the property of acting as a precursor of vitamin A.

For the purpose of identifying the predominant carotenoid pigments from the sweet potato, the deeply colored variety known as "Porto Rico" was obtained from the local market. Twenty pounds of fresh tubers were ground through a meat grinder and allowed to fall into a salt solution. To this mixture was added an equal volume of ninety-two per cent alcohol. The excess solvent was removed in a press and the process repeated with sixty per cent alcohol. The alcoholic extracts were discarded. Alternate extraction with acetone and petroleum ether yielded solutions which were worked up as follows:

In each case the solution was evaporated to dryness in vacuo and taken up in a small amount of carbon disulphide, and absolute alcohol was added. This yielded a crop of large pleochromatic crystals. On concentration of the mother liquor considerable colorless material separated, and, therefore, saponification with sodium methylate was resorted to. The petroleum ether solution from the saponified material was repeatedly shaken with eighty-five per cent alcohol.

The residue remaining after evaporation of the petroleum ether layer was taken up in a small volume of carbon disulphide, and absolute alcohol was added. Crystals of pigment separated on standing and after concentration of the mother liquor.

Attempts to isolate crystalline xanthophylls from the alcohol phase proved futile because of the small amount of pigment and the large amount of colorless impurities. However, a fraction was obtained which gave a blue color with formic acid and with concentrated hydrochloric acid, indicating the presence of violaxanthin. A spectro-

¹ Food Research Division Contribution No. 340. Received September 20, 1937.